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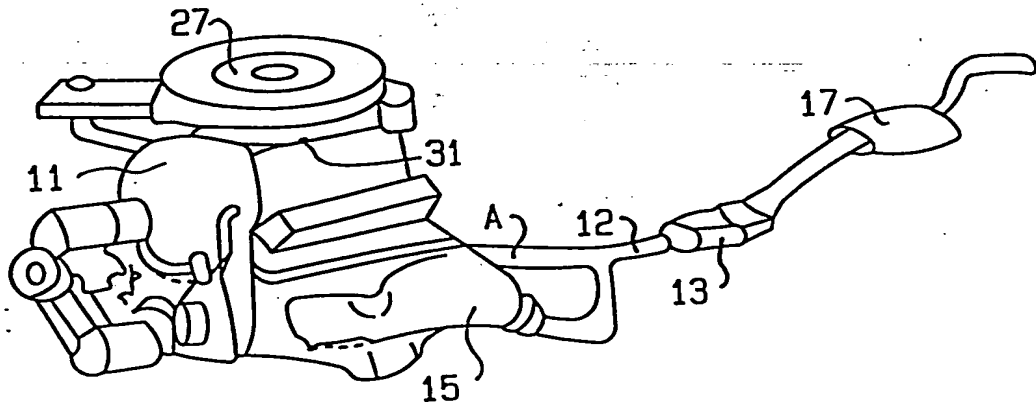


FIG. 1
(Prior Art)

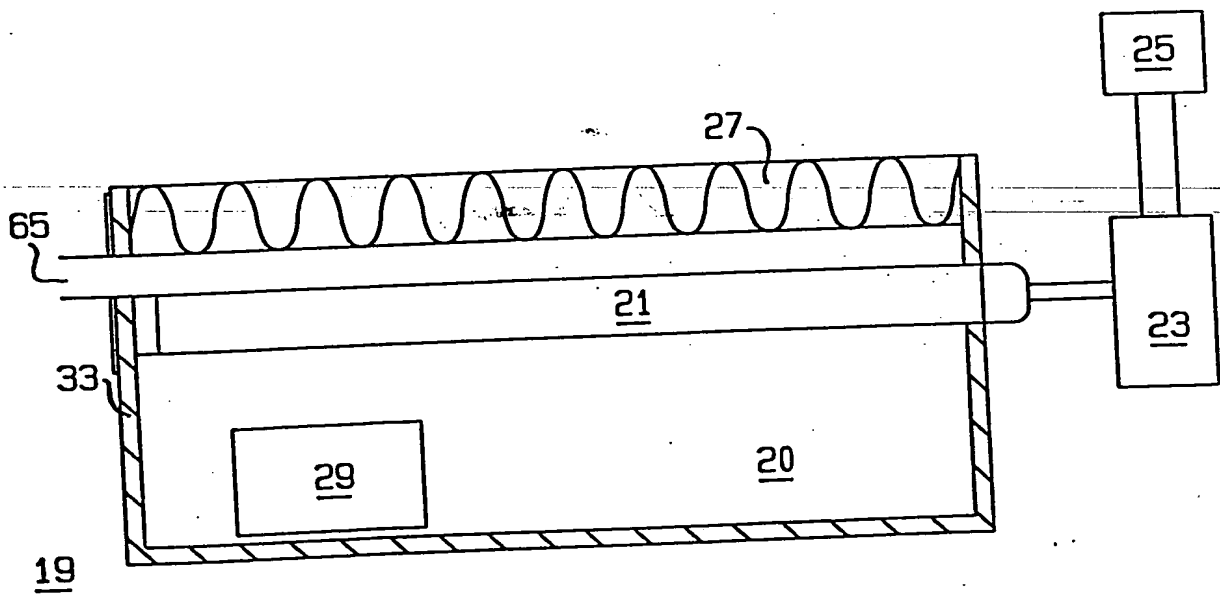


FIG. 2

The diagram illustrates a closed-loop system for generating and utilizing chemical species. The components and their interconnections are as follows:

- Air₂**: Input air source at the top left.
- Pump**: A rectangular box connected to the **Air₂** input and the **Generator**.
- Generator 20**: A rectangular box that produces chemical species. It is connected to the **Pump** and the **Engine**.
- Engine 11**: A rectangular box that utilizes the chemical species. It is connected to the **Generator** and the **Catalyst**.
- Catalyst 13**: A rectangular box that regenerates the chemical species. It is connected to the **Engine** and the **Generator**.
- 50**: A rectangular box connected to the **Generator** and the **Catalyst**.
- 43**: A rectangular box connected to the **Catalyst** and the **Generator**.
- 41**: A circular component (likely a valve or sensor) located on the line connecting the **Generator** to the **Engine**.
- 44**: A circular component (likely a valve or sensor) located on the line connecting the **Engine** to the **Catalyst**.
- 55**: A rectangular box connected to the **Engine** and the **Catalyst**.
- 51**: A dashed line connecting the **Generator** to the **50** box.
- 39**: A label near the **Pump** input.
- Air**: A label near the **Engine** input.
- E**: A label near the **43** box.
- Chemical Species**: A list of species produced by the **Generator**:
 - Hydroxyl-ozone
 - Hydrogen peroxide
 - atomic oxygen

FIG. 4

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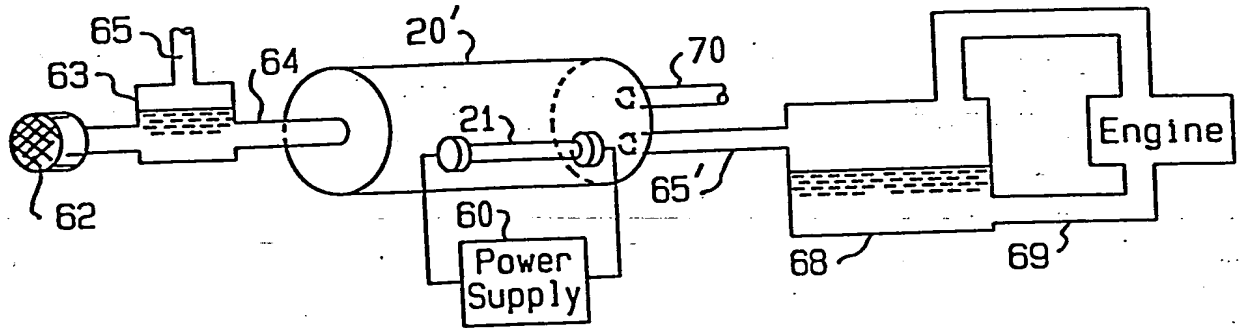


FIG. 5

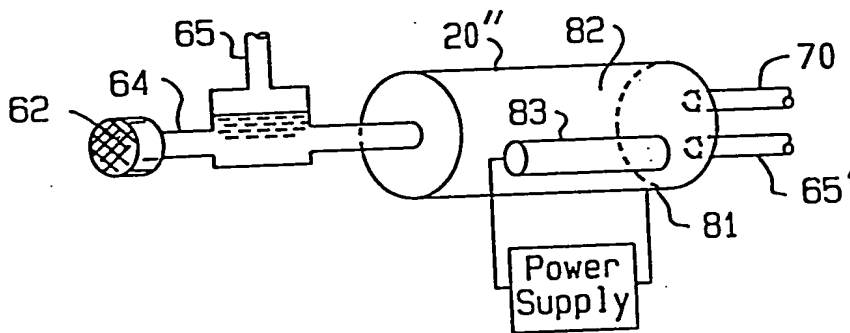


FIG. 6

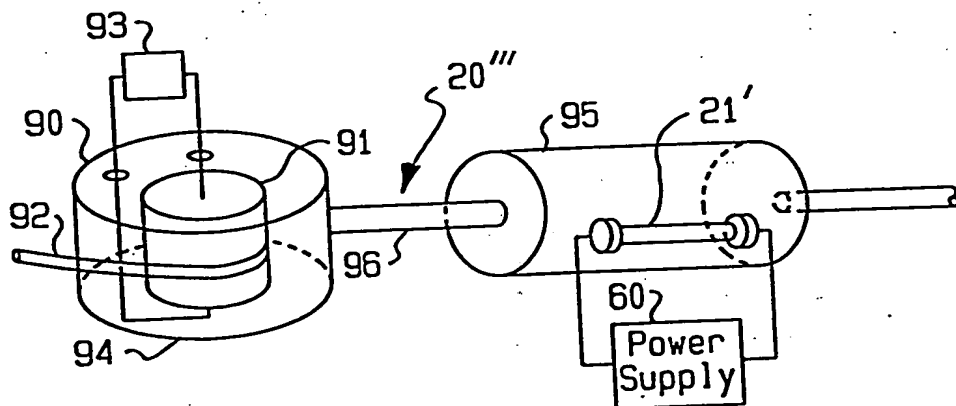


FIG. 7

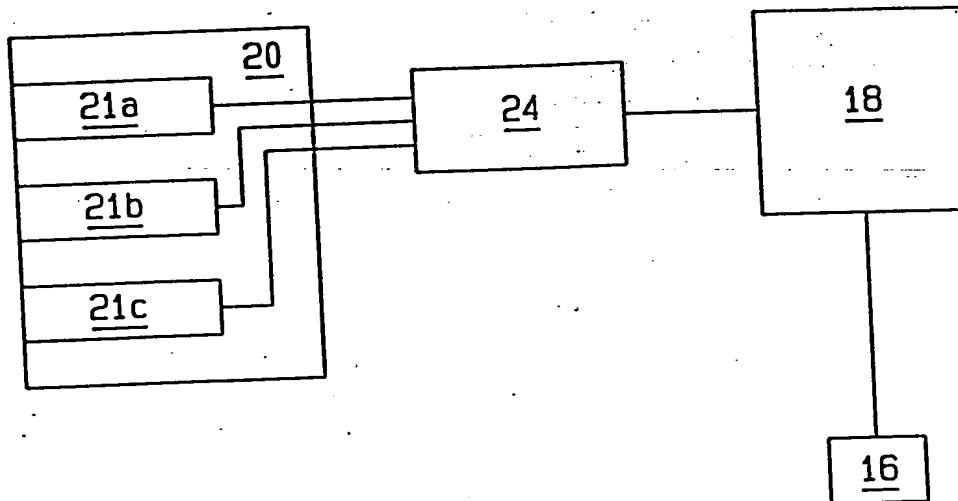


FIG. 8

Adding Hydroxyl to the combustion flow stream at least one point upstream or at the catalytic converter for treating exhaust gases produced by a combustion engine to at least reduce one pollutant from incomplete Combustion and/or oxides of nitrogen

Treating the exhaust gases with a high surface receptacle such as a catalytic converter

FIG. 9